WHAT IS CLAIMED IS:

1. An endoscope system having an insertion member wound about a drum comprising:

an electronic endoscope having a solid-state imaging element incorporated at a tip of an insertion member, a bending section included in the insertion member being motor-driven to bend;

a drum having the insertion member wound about the outer circumference thereof;

an angling input unit at which an operator enters a direction of bending in which the bending section bends, and which is separated from the electronic endoscope;

a motor-driven angling unit incorporated in the drum and including a driving source for driving a driving mechanism that drives the bending section;

a camera control unit that controls the solid-state imaging element and includes a signal processor for processing an electric signal sent from the solid-state imaging element to produce a video signal;

a motor-driven angling control circuit unit for controlling the movement of the bending section; and

a stowage case in which the drum is rotatably stowed freely.

2. An endoscope system according to claim 1, wherein: the electronic endoscope includes an illumination optical system; and a light source unit for supplying illumination light to the illumination optical system is incorporated in the drum.

3. An endoscope system according to claim 1, further comprising:

a frame for holding the drum; and

a bearing means fixed to the frame in order to rotatably hold the outer edge of the drum freely, which is located away from the center of rotation of the drum.

4. An endoscope system according to claim 3, wherein the bearing means rotatably holds the outer edge of one side surface of the drum freely, which is located away from the center of rotation of the drum.

5. An endoscope system according to claim 3, further comprising:

a plurality of bearings fixed to one side surface of the drum coaxially with the drum; and

an annular rail mounted on the frame in which the drum is supported and locked, serving as a receiving surface that receives the bearings fixed to the drum, and being

concentric with the drum.

6. An endoscope system according to claim 5, wherein the bearings are made of ball bearings.

7. An endoscope system according to claim 6, wherein the bearings and the rail have concave and convex, of which cross sections are shaped like letter V, engaged with one another.

8. An endoscope system according to claim 3, wherein a coupling mechanism for electrically coupling electric equipment located inside the drum with electric equipment located outside the drum is provided near the center of rotation of the drum in the bearing means.

9. An endoscope system according to claim 1, further comprising:

a first opening and a second opening opposed to a side surface of the drum provided on one surface of the stowage case;

a cover member freely detachably attached over the tip of an extension, which juts out from the side surface of the drum and penetrates through the first opening, in order to cover the first opening; and

a lid member detachably attached in order to cover the second opening,

wherein an adjusting mechanism in the rotating drum is exposed by removing the cover member and the lid member.

10. An endoscope system according to claim 9, wherein the first opening is a substantially round opening, and the cover member is substantially round and has a diameter larger than at least the inner diameter of the first opening.

11. An endoscope system according to claim 9, wherein the adjusting mechanism is a mechanism to adjust the bending section provided in the insertion member of the endoscope, and includes at least an angulation wire adjusting unit.

12. An endoscope system according to claim 9, wherein the adjusting mechanism can be adjusted from outside the case by being exposed.

13. An endoscope system according to claim 1, further comprising a flexible flat cable over which signals are transferred between first electric equipment provided inside the case outside the rotating drum and both or either of the endoscope and the rotating drum, wherein:

the flat cable is curled around the center rotation

shaft of the rotating drum; and

when the flat cable is extended from the center rotation shaft, a sufficiently large distance is preserved for electric isolation between the flexible flat cable and a metallic part of the rotating drum and between the flexible flat cable and second electric equipment incorporated in the rotating drum.

14. An endoscope system according to claim 13, wherein primary voltage is applied to the flexible flat cable, and secondary voltage is applied to the second electric equipment incorporated in the rotating drum.

15. An endoscope system according to claim 13, wherein a sufficiently large distance is preserved for electric isolation with an isolator interposed between the metallic part of the rotating drum opposed to the flexible flat cable and the second electric equipment.

16. An endoscope system according to claim 13, wherein a stowage for the flexible flat cable is made of a resin that is an electrically insulating material, and a sufficiently large distance is preserved for electric isolation between the metallic part of the rotating drum that comes into contact with the stowage and the flexible

flat cable.

17. An endoscope system according to claim 13 or 14, wherein the electric equipment incorporated in the drum is a printed-circuit board electrically coupled to the flexible flat cable, and a flexible thin-film isolator sheet such as a Mylar sheet is placed in a space created between the printed-circuit board and the flexible flat cable.

18. An endoscope system according to claim 13 or 14, wherein a printed-circuit board is electrically coupled to each of the first electric equipment located outside the drum and the flexible flat cable, and a flexible thin-film isolator sheet such as a Mylar sheet is placed in a space created between the printed-circuit board and the flexible flat cable.

19. An endoscope system according to claim 16, wherein the flexible flat cable electrically coupled to the second electric equipment is inserted into a stowage for the flexible flat cable from near the center of rotation of the rotating drum, passed through the interior of a cylindrical member placed coaxially with the rotating drum, drawn out from a notch, which is formed in the cylindrical surface of the cylindrical member, while being clamped by a clamp

member, and wound about the cylindrical surface.

20. An endoscope system according to claim 13, wherein the flexible flat cable comprises a first flat cable and a second flat cable that are separated from each other, and the first flat cable and the second flat cable are stowed in two adjacent stowages.

21. An endoscope system according to claim 20, wherein a video signal channel for transmitting a video signal and a power channel for transmitting power are provided at the side of the first flat cable and at the side of the second flat cable, respectively.

22. An endoscope system according to claim 1, further comprising a plurality of devices that is stowed in the drum, and transfers illumination light or electric signals used to control or activate the endoscope, wherein:

among the devices, a light source device for supplying illumination light, with which an object of observation is illuminated, from the tip of the endoscope is placed close at the side of one of spaces in the drum, and the other devices are placed close at the side of the other space in the drum.

23. An endoscope system according to claim 22, wherein an adiabatic panel is interposed between the light source device and the other devices excluding the light source device.

24. An endoscope system according to claim 23, wherein electric parts are mounted on the adiabatic panel in order to thus form a printed-circuit board.

25. An endoscope system according to claim 1, further comprising:

a holding mechanism for rotatably holding the drum freely; and

a detecting means for mechanically detecting information of a length by which the insertion member is wound about the drum, and electrically outputting the detected information.

26. An endoscope system according to claim 25, wherein the detecting means is a number-of-rotations detecting means for detecting the number of rotations of the drum associated with the length by which the insertion member is wound.

27. An endoscope system according to claim 26, wherein the number-of-rotations detecting means includes a sliding

resistor that has a lever coupled to a variable resistance terminal thereof, and the lever is mechanically freely movable between a point on the drum at which the insertion member is started to be wound and a point thereon at which the insertion member is wound to the greatest extent.

28. An endoscope system according to claim 25, wherein the detecting means detects information of a length, by which the insertion member is wound, irrespective of whether the power supply is turned on or off.

29. An endoscope system according to claim 25, wherein the detecting means includes:

a drum-side gear formed on the periphery of a side panel of the drum as an integral part of the side panel or as a part independent of the side panel;

a gear member provided to the frame member in which the drum is held, and engaged with the drum-side gear;

a male screw member to be rotated responsively to the rotation of the drum;

a sliding member screwed to the male screw member and axially movable responsively to the rotation of the male screw member;

a guide member for restricting rotation of the sliding member; and

a sliding resistor fixed to the frame member, moved together with the sliding member while engaged with part of the sliding member, and having a lever coupled to a variable resistance terminal thereof.

30. An endoscope system comprising:

a rotatable drum about which an insertion member of an endoscope can be wound and from which the insertion member is extended;

a holding mechanism for rotatably holding the drum freely; and

a detecting means for detecting information of a length, by which the insertion member is wound about the drum, irrespective of whether the power supply is turned on or off, and electrically outputting the detected information.

31. An endoscope system according to claim 26, wherein the number-of-rotations detecting means includes a multi-rotation variable resistor for mechanically movably a rotation shaft freely connected to a variable resistance terminal thereof, and the rotation shaft can freely rotate or move between a point on the drum at which the insertion member is started to be wound and a point thereon at which the insertion member is wound to the greatest extent.

32. An endoscope system according to claim 25, further comprising a control circuit for acquiring the information from the detecting means, and controlling based on the acquired information whether an electric equipment should be activated or inactivated.

33. An endoscope system according to claim 32, wherein the electric equipment includes a light source lamp, and the control circuit controls based on the acquired information whether the light source lamp should be activated or inactivated.

34. An endoscope system according to claim 32, wherein the electric equipment includes a drive unit for performing motor-driven bending of the bending section, and the control circuit controls based on the acquired information whether the drive unit should be activated or inactivated.

35. An endoscope system according to claim 32, wherein the electric equipment includes a camera control unit, and the control circuit controls based on the information whether the camera control unit should be activated or inactivated.

36. An endoscope system according to claim 34, wherein

the bent bending section is brought back to a neutral state when enabled motor-driven angling is disabled.

37. An endoscope system according to claim 1, wherein a magnitude of traction exerted in pulling an angulation wire so as to bend the bending section to the greatest extent is determined by software.

38. An endoscope system according to claim 25, wherein information from the detecting means is acquired, and a magnitude of traction exerted in pulling the angulation wire using the drive unit is varied corresponding to the number of rotations of the drum based on the acquired information.

39. An endoscope system according to claim 32, wherein whether the electric equipment is activated or inactivated is displayed on a screen on which an image picked up by an imaging means incorporated in the insertion member is displayed.

40. An endoscope system according to claim 1, further comprising:

a frame member for rotatably bearing the drum freely;

a first gear provided on the outer circumference of at least one of a pair of side panels placed on the side panel

of the drum;

a second gear engaged with the first gear for fixing to the frame member;

a male screw member formed on the shaft of the second gear extended along the axis of rotation of the drum, hung between at least the pair of side panels, and rotated while interlocked with the drum;

a first stopper member screwed to the male screw member, and capable of reciprocating between the pair of side panels;

second and third stoppers provided on the inner surfaces of the pair of side panels so that the second and third stoppers will abut on the first stopper so as to prohibit further rotation of the drum when the insertion member of the endoscope is taken up or thrust out to the greatest extent, and;

a third gear fixed to the frame member so that the third gear will be freely engaged with or freed from the first gear;

a constraining member for constraining the third gear to move towards the first gear so that the third gear will be engaged with the first gear; and

a clutching mechanism for prohibiting rotation of the drum in a direction of rotation permitting thrusting out of the insertion member of the endoscope when the third gear is

engaged with the first gear.

41. An endoscope system according to claim 40, wherein the clutching mechanism includes an operator lever mechanism capable of being freely set to a position permitting the third gear to be engaged with the first gear or a position permitting the third gear to be freed from the first gear.

42. An endoscope system according to claim 41, further comprising a case body in which the drum is stowed, and a lid placed on the case body, wherein:

when the third gear is freed from the first gear, at least part of the operator lever mechanism is located over the part of the case body engaged with the lid, and the lid cannot therefore be placed on the case body.

43. An endoscope system according to claim 41, wherein when an operator lever is pushed manually, the operator lever mechanism frees the third gear that is engaged with the first gear owing to the constraining member, and enables the drum to rotate freely.

44. An endoscope system according to claim 41, wherein when an operator lever is pushed to be turned, the operator lever mechanism frees the third gear that is engaged with

the first gear owing to the constraining member, and keeps a rorating state of the drum in a free state.

45. An endoscope system according to claim 1, further comprising:

a rotational panel placed on a side panel of the drum, and including a lever used to rotate the drum;

a torque conveying member for conveying torque of the rotational panel to the drum; and

a mechanism for conveying torque, which is conveyed by the torque conveying member in order to produce one-way rotation, to the drum.

46. An endoscope system according to claim 45, wherein the mechanism is a one-way clutch.

47. An endoscope system according to claim 45, wherein the mechanism includes a sprocket and a claw that moves in one direction alone to engage with the sprocket.

48. An endoscope system according to claim 1, further comprising a mechanism for adjusting a level of torque to stabilize the torque that causes the drum to rotate.

49. An endoscope system according to claim 1, further

comprising:

a frame for rotatably holding the drum freely;

a shock absorber interposed between the outer surface of the frame and the inner surface of the case opposed to the outer surface in order to absorb shocks applied in a direction parallel to the outer surface and inner surface; and

a holding means for holding the shock absorber with the respective edges of the shock absorber, which extend along the direction parallel to the outer surface and inner surface, abutted on the case and the frame respectively.

50. An endoscope system according to claim 49, wherein the case is structured to be divided in directions perpendicular to the direction parallel to the outer surface and inner surface.

51. An endoscope system according to claim 49, wherein the case includes a case body that can be opened and closed in the directions and a lid member.

52. An endoscope system according to claim 49, wherein the case is shaped like a box and has shock absorbers, which absorb shocks, attached to the respective corners of the outer surface thereof.

53. An endoscope system according to claim 49, wherein the shock absorbers are shaped like plates whose length in the directions is larger than the thickness of the outer surface of the frame and the thickness of the inner surface of the case.

54. An endoscope system according to claim 49, wherein the case is molded or die-cast using a resin, and the frame is made of a metal.

55. An endoscope system according to claim 51, wherein a panel is fixed to the frame in order to block an opening of the case body, which is covered by the lid member, perpendicularly to the directions.

56. An endoscope system according to claim 55, wherein a monitor on which an endoscopic image is displayed is placed between the panel and the inner surface of the lid member.

57. An endoscope system according to claim 1, further comprising:

a panel placed on a surface of the case beyond which the insertion member is taken up or thrust out;

a first elastic member jutted from the panel to the outside of the case so that the insertion member can be loosely inserted in the first elastic member; and

a second elastic member having a hole whose diameter is smaller than the outer diameter of the insertion member in a natural state, and mounted at the tip of the first elastic member, the insertion member being passed through the hole.

58. An endoscope system according to claim 57, wherein: the first elastic member has a bellows-like extensible part that communicates with a part thereof mounted on the panel and the tip thereof; a screw is threaded on the outer circumference of the extensible part; a hole whose diameter is larger than the diameter of the insertion member is formed at the tip of the first elastic member; a first metallic member having a screw threaded thereon is fixed on the outer circumference; a second metallic member is screwed to the screw threaded on the first metallic member; and a hole whose diameter is substantially the same as the diameter of the hole in which the second metallic member is formed on the first metallic member.

59. An endoscope system according to claim 57, wherein a brush-like member with a thin wire is fixed to the

circumference of the second elastic member.

60. An endoscope system according to claim 57, wherein a first peripheral equipment required for the endoscope is stowed in an internal space of the drum, and second peripheral equipment is stowed together with the drum in the case.

61. An endoscope system according to claim 1, wherein: a round opening opposed to a side panel of the drum is formed in one surface of the case; a round cover member whose diameter is larger than the inner diameter of the opening is provided at the tip of an extension that juts the opening from the side panel of the drum; and an elastic member pressured on the inner side surface of the cover member is provided to the perimeter of the opening.

62. An endoscope system according to claim 61, wherein the elastic member has the proximal part thereof fixed to the opening, and has the tip thereof shaped like a fin whose free end is pressured against the round cover.

63. An endoscope system according to claim 61, wherein a handle member used to rotate the drum is provided on the outer side surface of the round cover member.

64. An endoscope system according to claim 63, wherein at least a holder of the handle member can be held while being folded towards the side panel of the drum.

65. An endoscope system according to claim 64, wherein a direction in which the handle member is folded is opposite to a direction of rotation permitting taking up of the insertion member.

66. An endoscope system according to claim 61, wherein: the handle member has the proximal stationary part thereof fixed to the round cover member; the proximal stationary part has a cylindrical part continuous to a hemispherical apex portion thereof, and has the cylindrical part and hemispherical apex portion thereof hollowed; a groove is formed to open on outside at the apex of the proximal stationary part, descend spirally to the middle of the outer circumference of the proximal stationary part, and further descend perpendicularly towards the bottom of the proximal stationary part; a shaft of the handle member is passed through the groove; an elastic member for constraining the proximal part of the holder to come into contact with the proximal stationary part is interposed between the handle-holder mounted on the outer circumference

of the shaft and the shaft; and the shaft is turned down along the groove due to the constraining force in a natural state.

67. An endoscope system according to claim 66, wherein the proximal stationary part of the handle member is fixed to the round cover member so that the shaft of the handle member will be turned down in a direction opposite to a direction, in which the handle member is turned at the time of taking up the insertion member, on a line segment linking the center of the proximal stationary part and the center of the rotating drum.

68. An endoscope system according to claim 61, wherein the extension is made of an elastic material such as a rubber.

69. An endoscope system according to claim 1, further comprising a case in which a frame accommodating the drum and peripheral equipment is stowed with a shock absorber between them, wherein an operator panel having at least operator switches, which are used to control the peripheral equipment, and a port through which the insertion member of the endoscope is taken up or thrust out is exposed on one surface of the case and fixed to the frame.

70. An endoscope system according to claim 69, wherein an intake vent and a discharge vent through which the peripheral equipment is aerated or deaerated are provided on the operator panel, and provided at right angles with respect to the perpendicular axis of the case placed to be usable.

71. An endoscope system according to claim 70, wherein the vents have eaves-like members projected from the upper sides thereof.

72. An endoscope system according to claim 69, wherein an elastic member is attached on the outer circumference of the operator panel in order to ensure watertightness for the case.

73. An endoscope system according to claim 1, further comprising an operation wire having one end thereof coupled to the bending section and having the other end thereof extended to the drum, wherein the bending section drive unit is an angling motor used to advance or withdraw the operation wire.

74. An endoscope system according to claim 73, wherein

the bending section has a fluid chamber that can be stretched in the axial direction of the bending section due to fluid pressure, and the bending section drive unit serves as a fluid supply/discharge member for supplying or discharging fluid to or from the fluid chamber.

75. An endoscope system according to claim 74, wherein the fluid supply/discharge member includes a cylinder/piston mechanism for supplying or discharging fluid to or from the fluid chamber, an operation motor, and a driving force converting mechanism for advancing or withdrawing the piston along with the rotation of the operation motor.

76. An endoscope system according to claim 73, further comprising an operation rod that has one end thereof coupled to the bending section, a cylinder provided behind the bending section, and a piston abutted on the other end of the operation rod, wherein the bending section drive unit serves as a fluid supply/discharge member that supplies or discharges fluid to or from the cylinder.

77. An endoscope system according to claim 76, wherein the fluid supply/discharge member includes a driving cylinder/piston mechanism that supplies or discharges fluid to or from the cylinder, an operation motor, and a driving

force converting mechanism that advances or withdraws the driving piston along with the rotation of the operation motor.

78. An endoscope system comprising:

an insertion member having a solid-state imaging element at a tip thereof, and including a bending section;

a drum about which the insertion member is wound with the proximal end of the insertion member fastened to the drum;

a bending section drive unit integrated with the drum, and used to bend the bending section;

an angling control circuit unit for controlling the bending section drive unit;

a video signal processing unit for processing a signal of the solid-state imaging element; and

a case in which the drum is stowed.

79. An endoscope system according to claim 78, further comprising an angling input control unit extended from a stowage for the insertion member to be used to transmit an angling control command to the angling control circuit unit.

80. An endoscope system according to claim 78, wherein the case has a passage hole through which the insertion

member is thrust out.